I CLAIM:

Sub #1

1. A saddle element for a static mixer comprising:

a generally ring-shaped support structure having a central axis, concentric inner and outer, radially spaced, circumferentially extending surfaces, and first and second axially spaced, generally parallel edge surfaces, said inner surface defining a fluid flow path which extends along said axis,

said edge surfaces being located in respective generally parallel transverse planes which are essentially perpendicular relative to said axis; and

a plurality of mixer components located in said flow path, said components having a first end which is closer to the transverse plane of said first edge than to the transverse plane of the second edge and a second end which is closer to the transverse plane of said second edge than to the transverse plane of the first edge,

said mixer components being arranged in at least two separate intersecting oblique planes, each of which intersecting oblique planes is disposed at an angle relative to said axis.

2. A saddle element as set forth in claim 1, wherein said components comprise crossbars, there being at least one crossbar in each of said intersecting oblique planes, said crossbars being disposed in a generally parallel relationship relative to one another.

3. A saddle element as set forth in claim 1, wherein said components are arranged in four separate oblique planes, said oblique planes being arranged in two separate pairs of oblique planes, the oblique planes of each pair being disposed in generally parallel, laterally spaced relationship relative to one another, the oblique planes of each pair being disposed so as to

intersect the oblique planes of the other pair along lines which are generally perpendicular to said axis.

4. A saddle element as set forth in claim 3, wherein said components are crossbars and at least two of said crossbars are arranged in each of said intersecting oblique planes, and wherein the crossbars of each oblique plane are disposed in generally parallel, laterally spaced relationship.

5. A saddle element as set forth in claim 3, wherein said components comprise crossbars arranged in an elongated, generally w-shaped array having a pair of spaced ends, said array being disposed to extend laterally across said flow path with each end thereof being attached to said inner surface.

6. A saddle element as set forth in claim 4, wherein said crossbars are arranged in an elongated, generally w-shaped array having a pair of spaced ends, said array being disposed to extend laterally across said flow path with each end thereof being attached to said inner surface.

7. A saddle element as set forth in claim 6, wherein two of said oblique planes intersect at a line disposed essentially in the transverse plane of said first edge and which extends through said axis, the first ends of the crossbars of said two of said oblique planes being connected together near said line.

8. A saddle element as set forth in claim 7, wherein the first end of a selected crossbar of a first oblique plane is attached to said inner surface at a location adjacent said first edge, the second end of a selected crossbar of a second oblique plane is attached to the second end of the selected crossbar of the first oblique plane, the first end of said selected crossbar of said second oblique plane is connected to the first end of a selected crossbar of a third oblique plane, the second

end of said selected crossbar of said third oblique plane is attached to the second end of a selected crossbar of a fourth oblique plane, and the first end of the selected crossbar of the fourth oblique plane is attached to said inner surface at a location adjacent said first edge, said selected crossbars extending laterally across said fluid flow path and presenting said w-shaped array.

9. A saddle element as set forth in claim 7, wherein said intersecting oblique planes intersect at an angle of about 90°.

10. A saddle element as set forth in claim 7, wherein said oblique planes are disposed at an angle of about 45° relative to said axis.

11. A saddle element as set forth in claim 4, wherein about 4 to 8 crossbars are arranged in each of said oblique planes.

12. A static mixer structure comprising two of the saddle elements of claim 1, said saddle elements being arranged with the second edge surfaces thereof disposed in mated, contacting relationship.

13. A static mixer structure comprising a first, a second, a third and a fourth of the saddle elements of claim 1, said saddle elements being arranged with the second edge surfaces of said first and second elements disposed in mated, contacting relationship, with the second edge surfaces of said third and fourth elements disposed in mated, contacting relationship, and with the first edge surfaces of said second and third elements disposed in mated, contacting relationship.

14. A static mixer structure comprising two of the saddle elements of claim 8, said saddle elements being arranged with the second edge surfaces thereof disposed in mated, contacting relationship.

15. A static mixer structure comprising a first, a second, a third and a fourth of the saddle elements of claim 8, said saddle elements being arranged with the second edge surfaces of said first and second elements disposed in mated, contacting relationship, with the second edge surfaces of said third and fourth elements disposed in mated, contacting relationship, and with the first edge surfaces of said second and third elements disposed in mated, contacting relationship.

16. A saddle element as set forth in claim 1, wherein said element comprises registration means for aligning the element with an adjacent element in a stack of elements.

17. A saddle element as set forth in claim 16, wherein said registration means comprises mating tab and notch elements.

18. A saddle element as set forth in claim 16, wherein said registration means comprises a first tab located on the first edge surface, a second tab located on the second edge surface, a first notch having a mating shape relative to said tabs located at said first edge surface and a second notch which also has a mating shape relative to said tabs located at said second edge surface, said tabs and said notches being positioned so as to cause the element to adopt a preestablished position relative to an adjacent saddle element.

19. A saddle element as set forth in claim 18, wherein said tabs are disposed in longitudinal alignment relative to the support structure at positions which are offset circumferentially essentially 90° relative to intersecting line 48.

20. A saddle element as set forth in claim 18, wherein said notches are offset 90° about said support structure relative to one another.

21. A saddle element as set forth in claim 19, wherein said notches are offset 90° about said support structure relative to one another.

11 22. A saddle element as set forth in claim 10, wherein the notch at the first edge surface is positioned directly opposite the tab on said first edge surface.